

# High Power Narrow Linewidth 1.26 Micron Ho-Doped Fiber Amplifier, Phase I

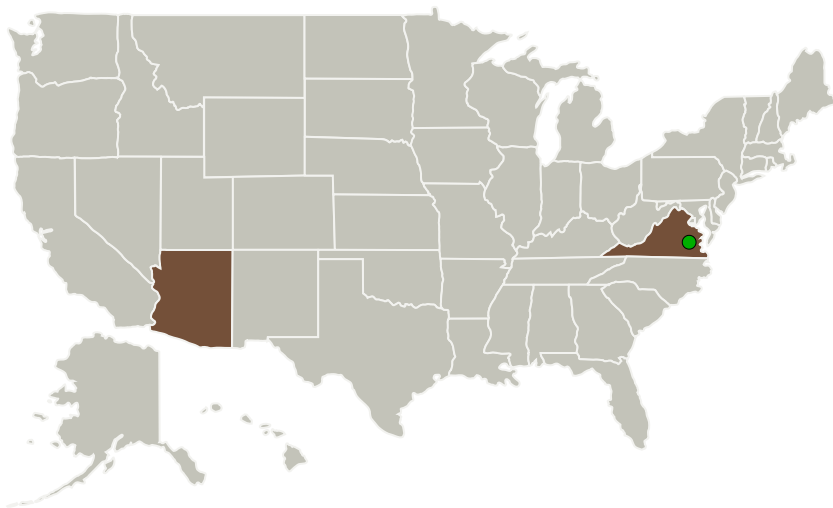
Completed Technology Project (2010 - 2010)



## Project Introduction

This proposal is for the development of an innovative, high power, and extremely reliable 1.26-micron Ho-doped fluoride fiber amplifier. The proposed fiber amplifier consists of a Ho-doped fluoride fiber pre-amplifier and power amplifier. Laser at 1187 nm will be used as a resonant pump laser source for Ho<sup>3+</sup>-doped fiber laser. High gain per unit length at 1.26 micron can be achieved in Ho-doped fluoride glass fiber due to the strong pump absorption at 1187 nm and strong emission at 1.2 micron transition. The proposed Ho-doped fiber amplifier will be implemented into a MOPA system with a 1.26 micron single frequency Ho-doped fiber laser. This type of fiber based seed laser is needed for remote sensing of O and O<sub>2</sub>-N for measuring atmospheric pressure. Concurrent on-board O<sub>2</sub> measurements using lines at 1.26 μm to allow for the best relative compensation for aerosol scattering along the line-of-sight of the CO<sub>2</sub> and O<sub>2</sub> measurements. The particular O<sub>2</sub> band was chosen so that the surface and atmospheric scattering characteristics from aerosols and thin clouds would be nearly the same as for the measurement of CO<sub>2</sub> at 1.57 μm. It's part of program to provide space-based active measurements of CO<sub>2</sub> for Active Sensing of CO<sub>2</sub> Emissions over Nights, Days, and Seasons (ASCENDS) Mission.

## Primary U.S. Work Locations and Key Partners



High Power Narrow Linewidth  
1.26 Micron Ho-Doped Fiber  
Amplifier, Phase I

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Organizations Performing Work	Role	Type	Location
NP Photonics, Inc.	Lead Organization	Industry	Tucson, Arizona
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Arizona	Virginia

## Project Transitions

▶ **January 2010:** Project Start

✓ **July 2010:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139984>)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

## Lead Organization:

NP Photonics, Inc.

## Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

Carlos Torrez

## Principal Investigator:

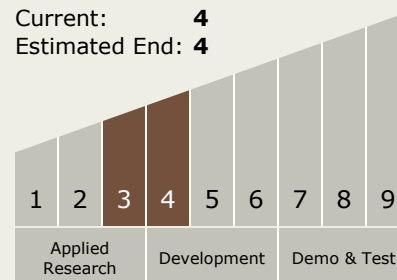
Jianfeng Wu

## Technology Maturity (TRL)

Start: 3

Current: 4

Estimated End: 4



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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.5 Lasers

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System